



Water Management Strategies

CCWA Board of Directors Meeting

January 27, 2022

Agenda



- Introductions
- Purpose and Goals
- Schedule & Process Review
- Model Overview
- Recommendations
- Q&A
- Next Steps

Purpose and Goal

To develop water management strategies to maximize yield of the State Water Project for San Luis Obispo and Santa Barbara counties through an iterative process of stakeholder engagement.



Team



Jim
Beck



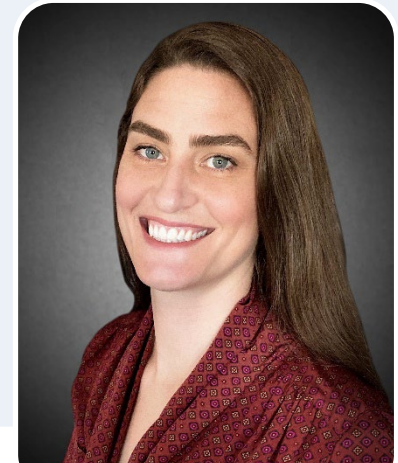
Terry
Erlewine, PE



Curtis
Creel, PE



Jessica
Alwan



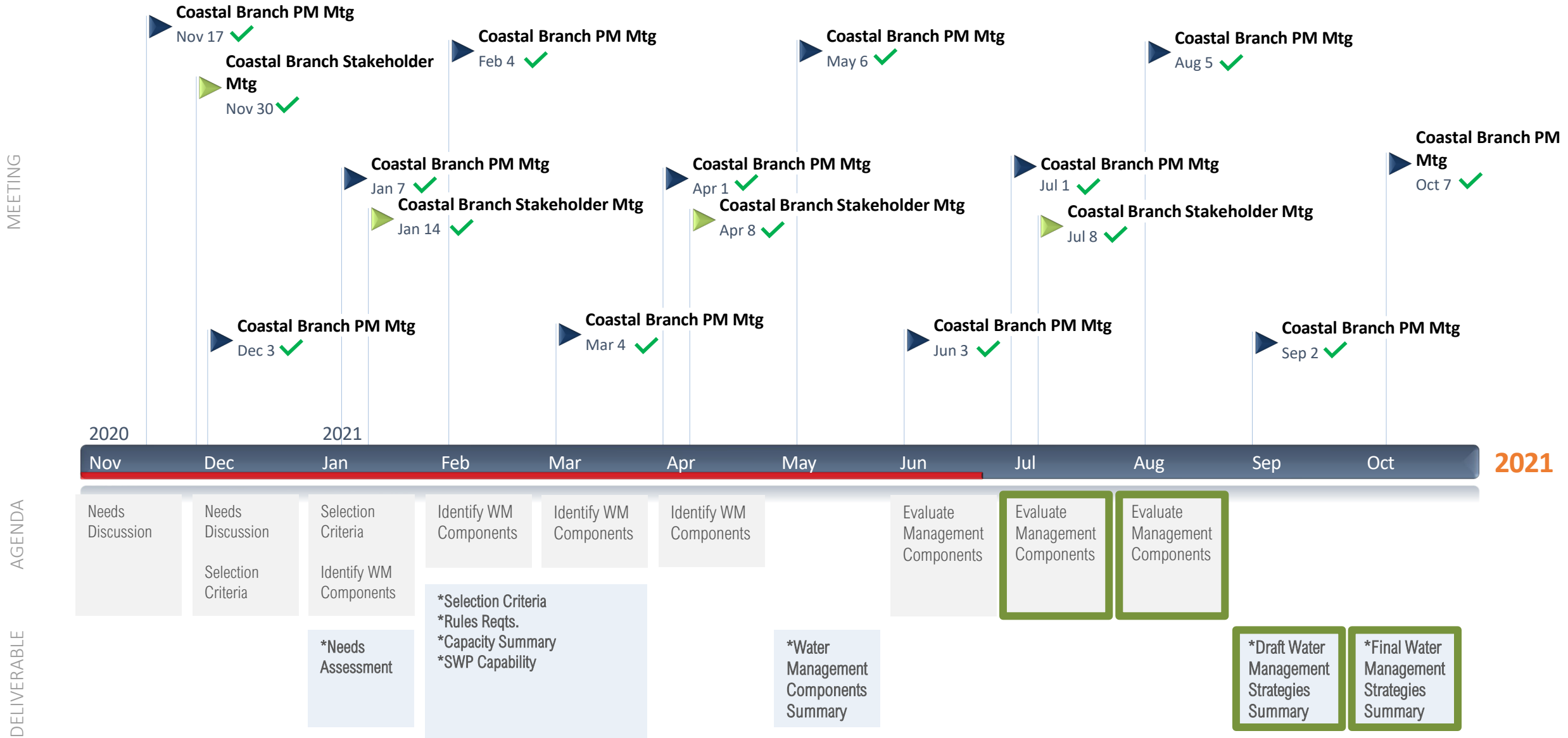
Sarah
Lee



Jessica Alwan

SCHEDULE AND PROCESS REVIEW

Water Management Strategies Schedule January 2022



Process Update

Key:

In Progress 
Complete 





Jim Beck

RECOMMENDATIONS SUMMARY

Recommendations Summary

1. Explore shared conveyance capacity program
2. Explore excess Table A transfer program
3. Explore external storage/exchange program
4. Refine model if Management Tool Amendment is not implemented
5. Explore alternative management of uncontracted SWP Table A
6. Explore supplemental groundwater supply options

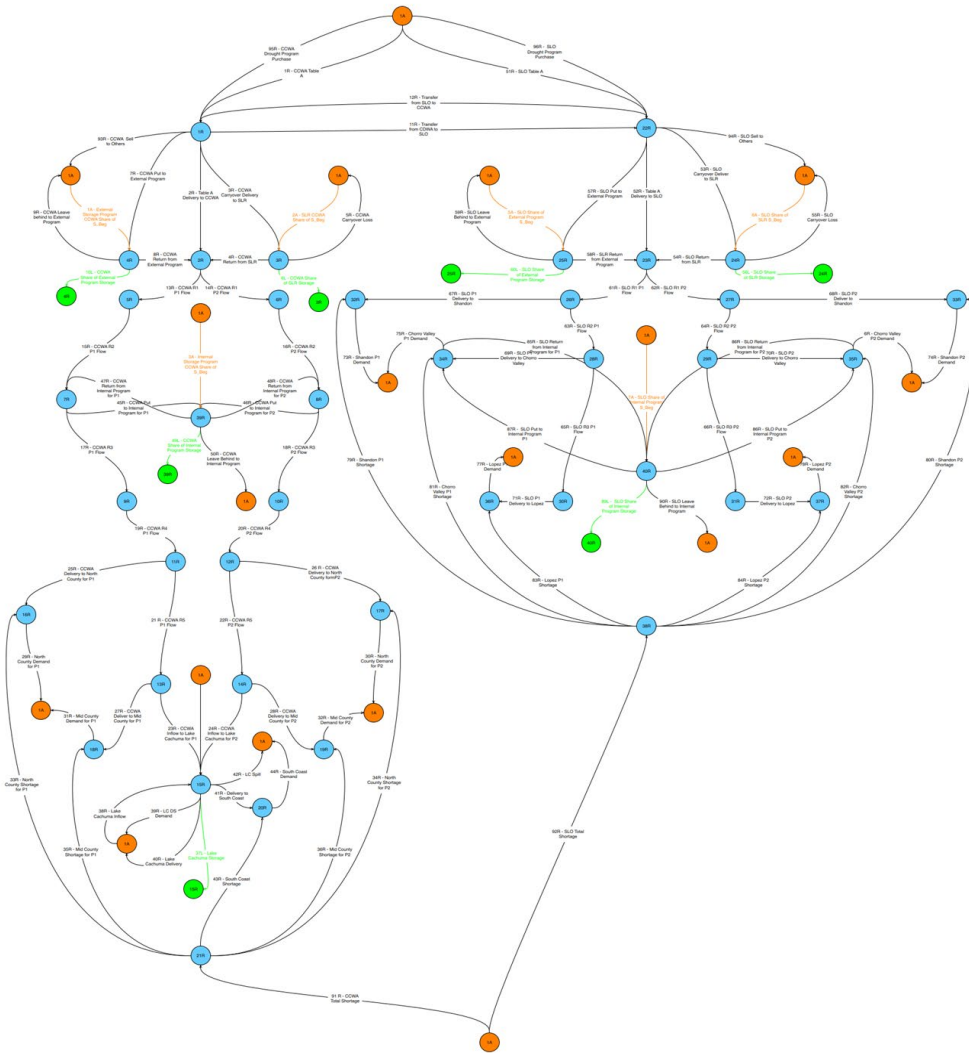


Terry Erlewine & Curtis Creel

MODEL OVERVIEW

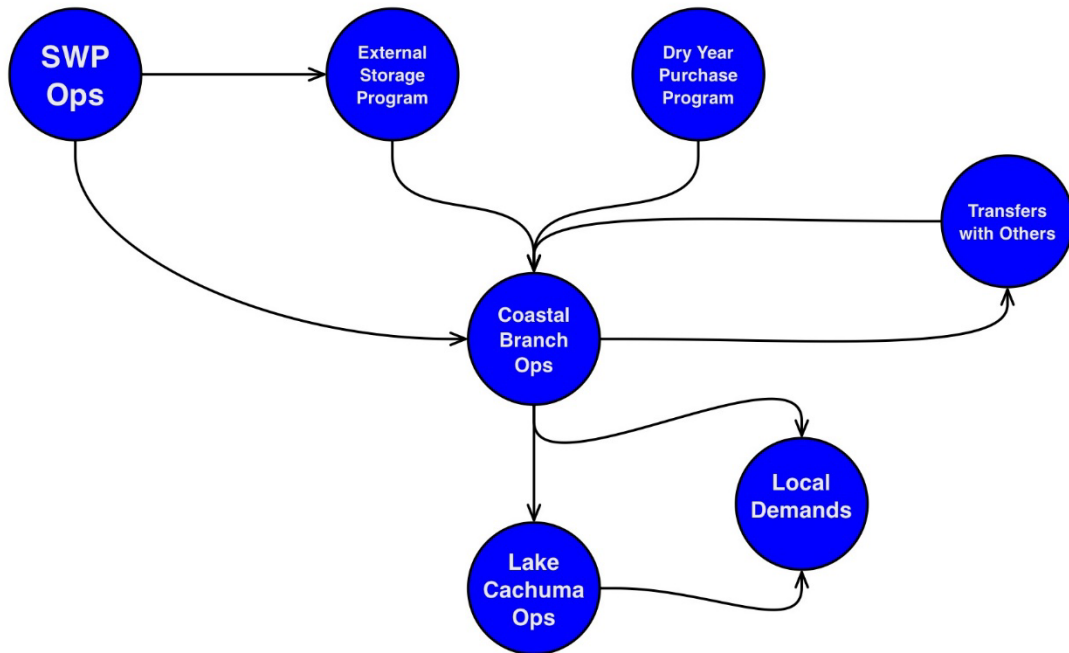
Used to Inform Report Conclusions and Recommendations

Model Overview



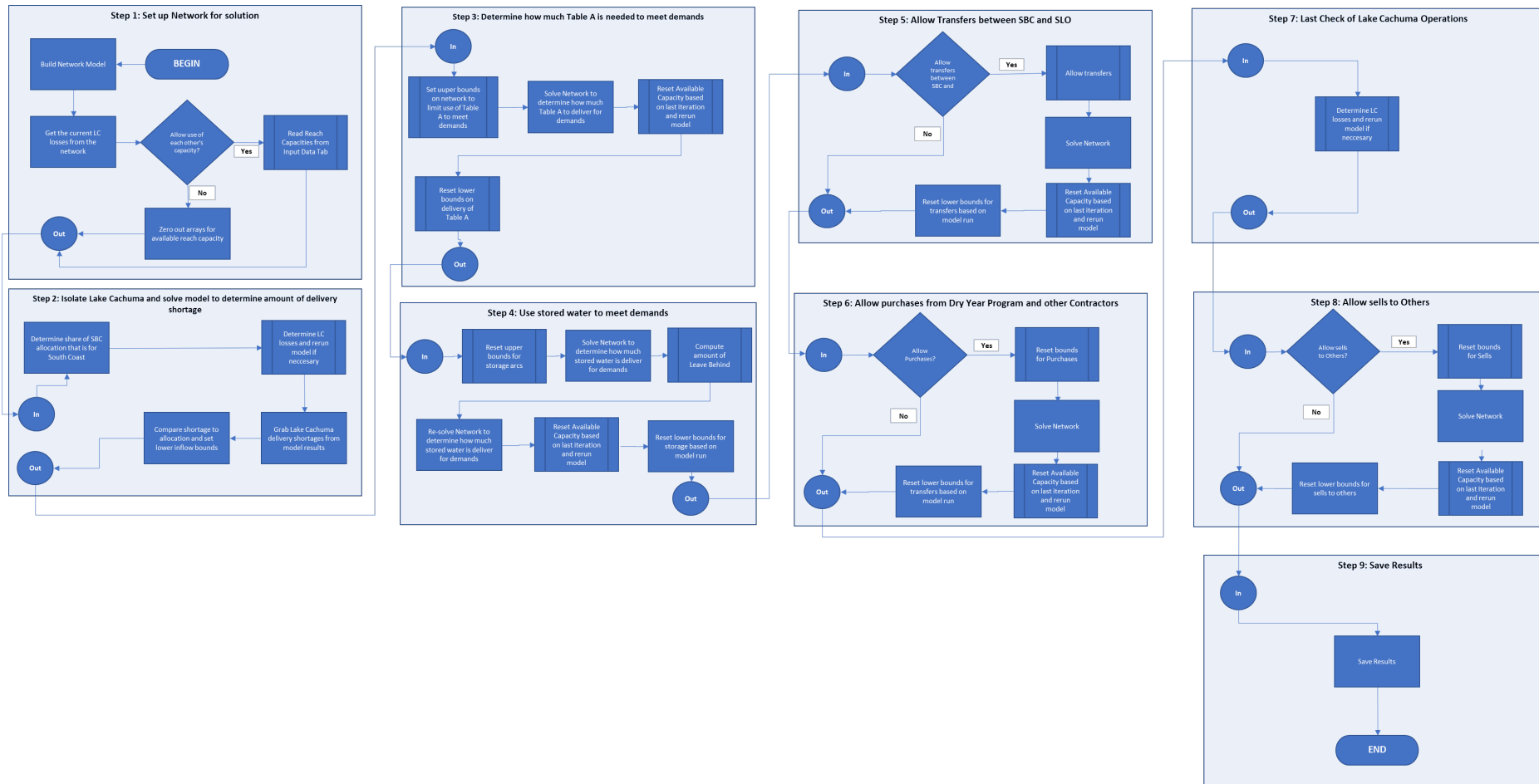
- Uses Network Flow Programming
- Minimizes delivery shortages
- Provides optimistic bookends of possible policies
- Used to compare alternatives

Model Overview – cont.



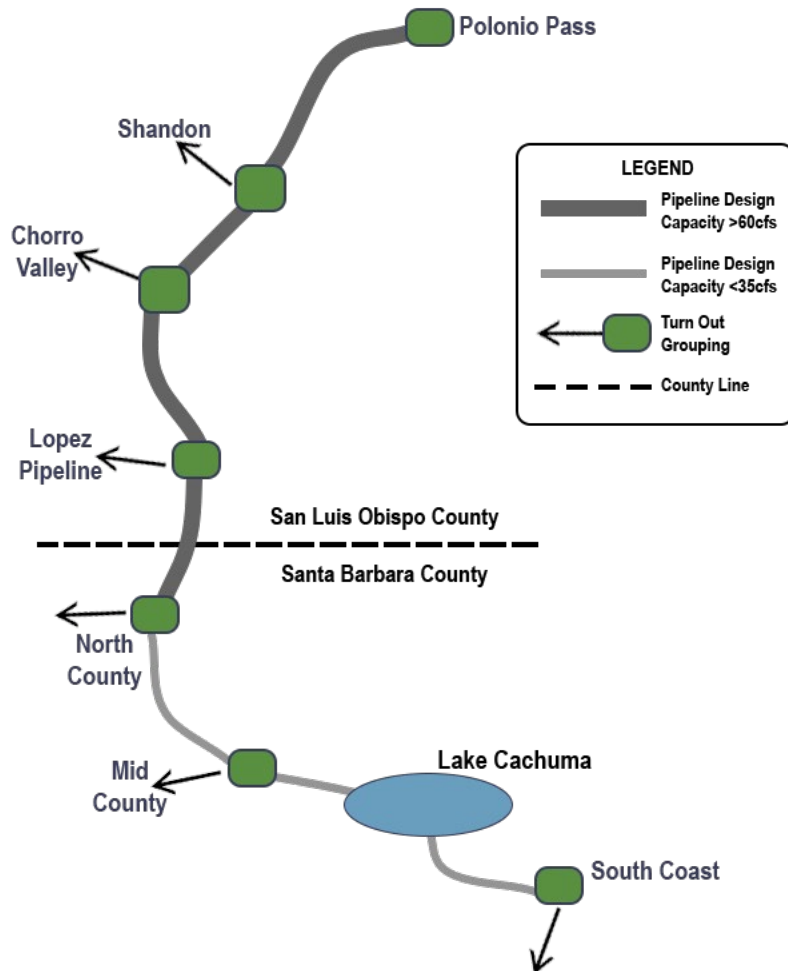
- Includes Seven Key Components
- Models CCWA and SLO water supplies and operations separately
- Uses Lake Cachuma to meet South County demands
- Pre-processes demands and allocations

Model Overview



Model Overview – cont.

State Water Project Coastal Branch



- 98 Year Study Horizon with annual time step
 - Sub-periods: (Oct-Apr, May-Sept)
- Demands aggregated into locations shown
- Conveyance capacity reflected between indicated demand locations
- SWP-centric analysis
 - Local water supplies not directly considered (exception is simplified Lake Cachuma operation)

Model SWP Operation Assumptions

Water Year	San Luis Operations				
	Max Winter-Spring SLR SWP Storage for small Contractors (taf)	CCWA Max Use of SLR (af)	SLO Contracted Max Use of SLR	SLO Non-Contracted Max Use of SLR	SLO Max Use of SLR (af)
1922	125	4,447	1,030	1,414	2,444
1923	77	2,752	637	875	1,512
1924	452	16,086	3,726	5,115	8,841
1925	111	3,933	911	1,251	2,162
1926	34	1,193	276	379	656
1927	57	2,030	470	645	1,116
1928	34	1,225	284	390	674
1929	116	4,114	953	1,308	2,261
1930	354	12,587	2,916	4,002	6,918
1931	-	-	-	-	-
1932	119	4,235	981	1,346	2,327
1933	9	317	74	101	174
1934	327	11,623	2,693	3,696	6,388
1935	5	171	40	55	94
1936	266	9,472	2,194	3,012	5,206
1937	5	179	42	57	99
1938	-	-	-	-	-
1939	118	4,186	970	1,331	2,301
1940	202	7,188	1,665	2,286	3,951
1941	-	-	-	-	-

- San Luis Reservoir operations based on CalSim II modeling
- Pre-processed to estimate available space to store CCWA and SLO Carryover
- In about 1 in 5 years, carryover is at risk of spilling

Model Transfer Assumptions

DRY YEAR PURCHASE PROGRAM

Year Type	Cost based on year type (\$/AF)	Max amount that can be purchased each year by all Contractors (AF)
Wet Years	\$ 75	0
Above Normal Years	\$ 75	0
Below Normal Years	\$ 500	0
Dry Years	\$ 750	100,000
Critically Dry Years	\$ 1,500	40,000

EXTERNAL PURCHASE PROGRAM

Year Type	Purchase Price for water from Others based on year type (\$/AF)	Potential Annual Supply to Coastal Branch Contractors (AF)
Wet Years	\$ 40	15,000
Above Normal Years	\$ 40	8,000
Below Normal Years	\$ 250	5,000
Dry Years	\$ 1,000	2,000
Critically Dry Years	\$ 2,000	500

- Transfers limited by available supply and demand based on water year types
- Pre-processed to determine annual availability

SALES PROGRAM PARAMETERS

Year Type	Sale of water to Others based on year type	Others Demand	Sale of Non-Cnrt to SLO Mus	Sale of Non-Cnrt to Others
1	\$ (35)	10,000	\$ (125)	\$ (50)
2	\$ (35)	25,000	\$ (175)	\$ (100)
3	\$ (150)	75,000	\$ (200)	\$ (200)
4	\$ (600)	75,000	\$ (400)	\$ (800)
5	\$ (1,200)	100,000	\$ (600)	\$ (1,500)

Coastal Branch Delivery Assumptions

Area	Table A Amount * (Acre-Feet)	Coastal Participant Amount (Acre-Feet)	Maximum Historical (Acre-Feet)	Average Historical (Acre-Feet)
SLO Uncontracted	14,463	0	0	0
SLO-North County	100	100	67	45
SLO-Chorro Valley	5,653	2,338	2,518	2,045
SLO-Lopez Pipeline	4,784	2,392	2,686	1,649
<i>Subtotal SLO</i>	<i>25,000</i>	<i>4,830</i>	<i>5,271</i>	<i>3,739</i>
SB-North County	18,975	17,250	14,641	10,536
SB-Mid County	8,886	8,078	6,831	4,217
SB-South Coast	17,625	13,750	15,587	6,811
<i>Subtotal SB</i>	<i>45,486</i>	<i>39,078</i>	<i>39,059</i>	<i>21,564</i>
Total	70,536	43,908	44,330	25,303

*Includes drought buffer amounts

Model Limitations

- Uses annual time step – limited modeling of inter-year operations
- The Model only considers deliveries from the Coastal Branch
- Does not model local water management activities
 - Local supplies
 - Local facilities
 - Local demand management strategies

Portfolio Summary

Portfolio	Acquire Dry Year Water	SLO Un-Contracted Use	Unused Capacity Access	CCWA External Storage Program	SLO External Storage Program	SLO GW Recharge	Transfer between CCWA and SLO	Acquire Water from Others	Sale Water to Others
F1	✓	✓	✓						
F2	✓	✓	✓	30 taf	10 taf				
F3	✓	✓	✓	30 taf	10 taf	1 taf			
F4	✓	✓	✓	30 taf	10 taf	1 taf	✓		
F5	✓	✓	✓	30 taf	10 taf	1 taf	✓	✓	✓

Selection Criteria

To best determine if a management measure should be implemented

Criteria	Measure	Considerations
✓ Water Supply	acre-feet cubic feet per second	Does the amount of volume or flow satisfy the participant need under a particular condition?
Water Quality	Maximum level and concentration	Is there difference in resulting water supply; how well does water supply meet water quality needs; are there any negative adverse water quality effects?
Ability to Permit	Weeks	How lengthy and difficult would permitting process be?
✓ Cost	Dollars	Is it affordable for the short term? Long term?
Proximity	Yes or no	Is the action local or imported? Will it shift supply to a more sustainable/long-term solution?
Equity	Yes or no	Do alternatives maintain or improve DAC and tribal access to adequate water supplies?
✓ Reliability	More or less	Is the supply cost and availability probable? Focus on moderate or extreme dry years?

Portfolio Results

Allocation Utilization

Portfolio	Description	CCWA % Table A Used	SLO % Table A Used
Portfolio 1 (F1)	Current Baseline Condition	46.1%	21.4%
Portfolio 2 (F2)	F1 plus using limited external storage	48.4%	22.1%
Portfolio 3 (F3)	F2 plus added demand for SLO GW Replenishment	48.5%	26.1%
Portfolio 4 (F4)	F3 plus allow transfers between CCWA and SLO	48.4%	31.0%
Portfolio 5 (F5)	F4 plus allow external purchases and sells	57.4%	52.4%

CCWA Long-term average allocation is 58%, far more than utilized

Portfolio Results

Deliveries, Shortages and Spill

Portfolio	Description	Table A Used (%)		Turnout Deliveries (AF)		Shortages (AF)		Carryover Spill (AF)	
		CCWA	SLO	CCWA	SLO	CCWA	SLO	CCWA	SLO
1 (F1)	Current Baseline Condition	46.1	21.4	21,146	5,239	2,473	32	5,424	9,151
2 (F2)	Baseline with Limited External Storage	48.4	22.1	22,026	5,271	1,380	0	4,365	8,984
3 (F3)	F2 with added SLO GW Demand	48.5	26.1	22,034	6,271	1,380	0	4,356	7,994
4 (F4)	F3 with CCWA ↔ SLO Transfers	48.4	31.0	23,210	6,271	442	0	4,370	6,761
5 (F5)	F4 with External Transfers	57.4	52.4	22,912	6,271	371	0	298	1,406

Portfolio Results

Water Supply and Shortage Cost

Portfolio	Description	CCWA Total Cost (\$/af)	SLO Total Cost (\$/af)	CCWA Shortage Cost (\$/af)	SLO Shortage Cost (\$/af)
Portfolio 1 (F1)	Current Baseline Condition	\$ 2,204	\$ 1,414	\$ 2,550	\$ 3,000
Portfolio 2 (F2)	F1 plus using limited external storage	\$ 2,194	\$ 1,494	\$ 2,515	
Portfolio 3 (F3)	F2 plus added demand for SLO GW Replenishment	\$ 2,193	\$ 1,277	\$ 2,515	
Portfolio 4 (F4)	F3 plus allow transfers between CCWA and SLO	\$ 2,128	\$ 1,118	\$ 2,835	
Portfolio 5 (F5)	F4 plus allow external purchases and sells	\$ 1,816	\$ 615	\$ 2,878	

Input Data

Water Supply and Shortage Cost

SWP Statement of Charges (2021 from Bulletin 132-2019)

Santa Barbara County		San Luis Obispo County	
<i>Fixed</i>	<i>Variable</i>	<i>Fixed</i>	<i>Variable</i>
\$ 43,475,308	\$ 134	\$ 6,670,739	\$ 134

Shortage Cost Multiplier 1.5

External Storage Program Cost Parameters

Cost/Storage	\$ 750
Term (years)	30
Rate	5.0%
Put Cost/AF	\$ 50
Return Cost/AF	\$ 100

Transfers/Purchases

Year Type	Cost
1	\$ 100
2	\$ 500
3	\$ 1,000
4	\$ 1,500
5	\$ 2,000



Jim Beck

CONCLUSIONS & RECOMMENDATIONS

SLOFCWCD Conclusions

- SLOFCWCD has adequate SWP water supplies to meet its current Participant and simulated additional demands in all years under historic hydrologic patterns.
- Assumes that it can use available Coastal Branch conveyance capacity beyond its contracted share and historic hydrologic patterns remain the same in the future.
- SLOFCWCD has unused SWP water supplies in most years that frequently spill from San Luis Reservoir.
- Supply could be sold to CCWA or other SWP Contractors to reduce its overall SWP costs.
- Access to the water market without regulating programs provides little financial benefit.

CCWA (SB) Conclusions

- As with SLOFCWCD, CCWA cannot store its unused SWP water supplies during high SWP allocation years for later use during lower SWP allocation years.
- A significant amount of its unused SWP water will spill from San Luis Reservoir.
- CCWA has frequent SWP supply shortages in dry years.
- CCWA's unused SWP water could be sold to other SWP Contractors and would reduce its overall SWP costs.
- The availability of annual or multi-year purchases with the SWP Water Management Amendment reduces shortages for CCWA.
- There is conveyance capacity available in the Coastal Branch in most years.

Recommendation 1

Explore a program to share conveyance capacity among the Coastal Branch Contractors.

- High level analysis of available unused capacity has been completed
- Optimized coordinated use of conveyance capacity available to CCWA and SLOFCWD could yield water supply and financial benefits to both organizations and their stakeholders
- Requires analysis of more detailed water supply and delivery schedules that could be completed with additional model refinement

Recommendation 2

Explore a program to transfer excess Table A
between SLOFCWCD and CCWA.

- While a purchase program with other SWP Contractors would help CCWA reduce its shortages, the greatest benefit from a transfer program would likely occur if it can purchase unused Table A from SLOFCWCD.

Recommendation 3

Explore an external storage/exchange program for the Coastal Branch Contractors

- Particularly if there is increased demand for State Water Project supplies in the Coastal Branch, dry years become more extreme and storage reliability in San Luis Reservoir changes.
- External storage and exchange programs would not be subject to spill as carryover stored in San Luis Reservoir; thus, reducing the risk of water supply loss.
- In addition, some of the water stored in an external program could be exchanged with the banking partner to reduce the cost of using the storage.

Recommendation 4

Refine quantitative analysis of Model limitations if CCWA and SLOFCWCD do not fully implement the Management Tool Amendment or attempt to integrate their operations.

- The Model currently aggregates the operations for CCWA and SLOFCWCD into a single model.
- Additionally, it does not segregate contract rights for each of the Coastal Branch Contractors' member agencies; therefore, it may overestimate the capability to meet demands in some years.
- If there are limitations on how individual member unit water allocations can be used and stored, these limitations would need to be added to the model to fully investigate how they would impact water management decisions.

Recommendation 5

Explore alternative management of SLOFCWCD's uncontracted SWP Table A.

- Available options include entering into contracts with other entities for purposes such as groundwater basin supply augmentation, one-year or multi-year sale of unused Table A or permanent sale of a portion of SLOFCWCD's uncontracted SWP Table A Amount.

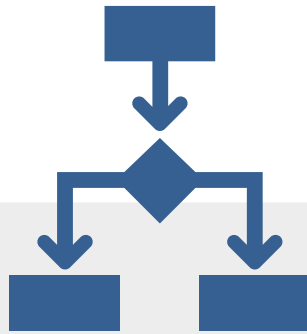
Recommendation 6

Explore supplemental groundwater supply options.

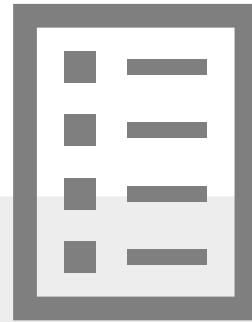
- Given the considerably higher value of SWP supplies through sales in drier years, an alternative approach for supplemental groundwater basin supply would be to provide higher amounts of water deliveries in wetter years and lower amounts (or none at all) in drier years.
- An intermittent SWP supply approach would likely be more cost effective for SWP supplies, but there would be a tradeoff from increased turnout and delivery facility costs for higher capacity deliveries and lower use factors.

Phase II: Potential Project Identification

Pending Board Approvals



Facilitation
of Decision
Process



Asset
Identification
and Model
Refinement



Potential
Projects and
Feasibility



Jim Beck

QUESTIONS